

RELEVANT AND FEASIBLE RESEARCH FOR
ICRISAT'S RESEARCH PROGRAM IN AGRICULTURAL MARKETS

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March 1980

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Barbara Harriss*

1. INTRODUCTION

ICRISAT's work is set in the context of the environmental and economic poverty of the semi-arid tropics (SAT). Yet there is enough evidence (reviewed for instance in CILSS/Club du Sahel, 1977; CEA0, 1977 as well as Harriss 1978a) to suggest that problems of undernutrition, of poverty in the consumption of the foodstuffs for which ICRISAT has a mandate, are more often due to imperfections in the social, spatial, seasonal and interseasonal *distribution* of foodgrains than due to problems in production, though the two obviously interact. It is essential that the operation and effects of the exchange or marketing systems be better understood; even if it is concluded that for the purposes of ICRISAT's applied research, the complex sphere of exchange is best regarded as an overarching net constraint, materially unreformable in the short and medium term.

In an agricultural economy, exchange systems operate in simultaneous (and potentially contradictory) ways both to enable some sort of allocation of resources and to extract a physical and financial surplus to support *inter alia* the non-agricultural sector. The system is never in equilibrium. The efficiency with which the exchange system transmits the price signals by which resources are allocated in agricultural production (subject to other constraints)

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This is a revised version of the paper presented at the workshop on *Socio-economic Constraints to Development of Semi-Arid Tropical Agriculture*, held at ICRISAT, Hyderabad, India, 19-23 February 1979.

The author is grateful to Deryke Belshaw, Hans P. Binswanger, John Cameron, Robert Chambers, John Harriss and James G. Ryan for their comments and discussion.

is always changing. The pace and direction of resource transfer is always changing, sometimes differently in different parts of the system in ways which standard "structure, conduct and performance" types of analysis and general equilibrium types of modelling do not help us adequately to understand.

It may actually be highly counterproductive to summarize or to generalize about the economic processes at work in the Sahel. Even the World Bank in its "World Development Report", 1978, emphasizes special problems with the intense individuality of each country comprising the macro region. However my review of literature (Harriss, 1978a) examines a number of case studies over the region which show that the social relations of exchange enable a small number of farmers to accumulate wealth in the form of grain and money, while they force many farmers to sell grain when prices are low; or they are forced to go into debt in kind to be repaid either in labor (thus lowering a critical input on farms) or in kind at a high disguised interest rate which depletes the debtor's resource base. Thus, crudely argued, the production of foodgrains slowly stagnates.

The intervention of the State in marketing is part of a massive general explosion of economic interventionism and is partly internationally financed. It is characterized by unviability and consequent financial dependence, lack of autonomy, overcentralization, weak and patchy implementation. It is structurally unstable, prematurely instituted but highly durable. It most probably alters the structure of private trade in favor of monopolies, thereby exacerbating what it intervenes to restrain, and it expands because it creates sources of income and privileged employment for bureaucrats as well as for private trade. Given this situation the latitude for reformist change is very limited.

However, permutations and combinations of components of the production and complex exchange systems at the local regional level (acknowledged by institutions such as the IBRD as that appropriate for research) may be conducive to progressive manipulation. We simply do not know. Though we know in outline how the marketing system operates, we do not know in a systematized way about such basic features of rural society as the size of the commodity market, what constitutes a surplus in grain, who accumulates money by trade and to what use such money is put, what the interactions between the State and (illegal) private trading systems consist of, and the nature of the interactions between the marketing systems for cash crops and those for crops usually known as "subsistence".

Without this basic knowledge our understanding of potentials for increasing agricultural production is confined to research station experimentation. There is thus ample justification for embarking on research designed to reduce ignorance. However, social science research carried out in an international crop breeding center requires more justification than the reduction of ignorance. It has to be relevant. At this point in time ICRISAT has to devise a program of relevant research within the formidable constraints of the economies of the Sahel and appropriate to them.

But what is relevant research? Binswanger and Ryan have investigated ex ante allocations of resources in agricultural research (1977) but not in agricultural economics research. Here we examine the thorny concept of relevance by relating it explicitly to the interests of various relevant groups:

- i) as ICRISAT sets out to formulate a research project in social science in the Sahel it is timely to look at the original justifications for social science research inside ICRISAT,
- ii) at the present relevance and function of such work,

- iii) at reasons behind directives for future research,
- iv) at the research priorities deemed important by international funding agencies who inter alia support ICRISAT,
- v) at the expectations of those who run the States concerned,
- vi) we may identify those areas which the literature neglects,
- vii) we shall consider research topics and methods which are likely to be in the interests of ICRISAT's stated target group.

It is not for me to weight these criteria. If, through this process, it becomes possible to identify topics of considerable common interest, it is contended that, subject to considerations of feasibility, these be taken up by ICRISAT's social science outreach program. The method adopted in the selection of research topics is thus formally and deliberately compromising. That then, is a map of the following paper.

2. ICRISAT'S PRESENT RESEARCH

2.1 Original Justification

In addition to an early effort by Ryan not reviewed here (Ryan 1974) ICRISAT's Economics Program made another attempt to set out its program for a specific portion of its social science research in 1974 : Binswanger, Ryan, von Oppen et al. "Hypotheses and Priorities for Village Level Studies in the Semi-Arid Tropics of India". The productivity of their research is such that with the elapsing of only four years it can be regarded as a benchmark historical document justifying action subsequently taken in the Village Level Studies. At a stage when ICRISAT embarks on new research in the Sahel, it is important to clarify the original operational rationale behind present work. This is only possible because ICRISAT's Economists are significantly more self-consciously critical than that of most international research institutes.

The Village Level Studies (VLS) comprise the major activity of the Economics Program (E.P.). But it must be emphasized at the outset that at no point has the E.P. identified its areas of interest as entirely congruent with VLS. "As much as possible, we will rely on studies by other researchers and on analysis of secondary data and on work done by organizations like the All India Coordinated Research Project for Dryland Agriculture" (1974, pp.3-4). Since there is no further justification for this we must accept the strong implication that insufficient research had been done on the analysis and synthesis of secondary data in SAT India and that ICRISAT's work effort should be interstitial, implying further that the interstices were of major importance.

The VLS are introduced as the economists' equivalent of laboratories-- as a means to answer questions and test hypotheses; emphasizing (as has done all subsequent formulation of projects rigidly in terms of hypotheses) the "scientific" nature of social science and strongly implying a belief in the social value of resources committed to providing quantified data to verify or refute hypotheses. In so doing there is little discussion of the problem of the inability to "control" for variables, or the inability to specify, let alone to quantify, all variables in a social laboratory.

The usefulness of such a process of defining and studying a social laboratory according to ICRISAT's economists, had to be judged i) "by how well it answers the questions asked" (thereby referring further justification back to a detailed consideration of these); ii) "by how useful the answers are to the biological scientists in establishing their research priorities"; and iii) by the impact of the answers on "general economic and social policy for the semi-arid tropics". In fact, consideration of the detailed research projects elaborated in the paper leads to a rough equation of i) and iii), since the

"policy relevance" of every hypothesis has to be specified. Using villages as social laboratories is therefore legitimated by the value of results to biological science (the servicing function) and by policy relevance. We shall look in turn at these two legitimations. The servicing function appears to place economics at the command of biological science. It is the general and explicit objective of economics within the research centers (CGIAR, 1977).

Priorities for the VLS were assigned to the array of topics generated on a complex qualitative interaction of four further criteria:

- i) the urgency of the need for other research work in ICRISAT (the servicing function);
- ii) the suitability of VLS to answer questions asked (so that the very existence of VLS itself modifies the questions asked);
- iii) the extent to which data required is tied to a cropping season (practical feasibility);
- iv) how much work is going on in the same subject outside ICRISAT (interstitial function).

A later document (Binswanger et al. 1977) states that another criterion at that time had been to "avoid needlessly complicating data gathering" (p.5). In this manner we arrive at the specification of eight research topics listed in order of priority.

The topics of research are justified in terms of policy relevance, in social managerial terms which imply that provided they are accurately substantiated, policy prescriptions will be made available to "Government" by an international research center then 'rational' decisions will be taken. This implies in turn that an autonomous bureaucracy (not politicians) make policy decisions--an implication which needs questioning--and that having been

taken they will be implemented even if against the interests of the implementers (another implication which needs questioning). It assumes that Government will succeed where peasants have been unable to. It further assumes the universality of empirically verified results whereas any actual universality consists in logic by which conclusions are derived from premises not in the validity of the results obtained from inevitably, a small and purposive sample (see Technical Advisory Committee 1978, p.83). Also, the difference between international policy, policy for the nation or state and policy for within ICRISAT needs spelling out more clearly with the latter confined in scope to being an aspect of the service function. According to the Technical Advisory Committee "policy relevance" is equivalent to "relevance to ICRISAT's mandate", (p.72, p.82, p.88). No studies of policy making and implementation as such have been carried out by ICRISAT though these come under its mandate.

The research methodology is positivist and hypothetico-deductive. (See Glastra van Loon, 1973, inter alia for a critique). Theories which do not yield predictions concerning observable quantifiable phenomena have not interested the E.P. The procedure of mapping out a research topic by hypotheses (which are really rephrased questions) and preconceived explanations (which are rephrased possible answers, these alone to be used for quantitative testing of the hypothesis) begs the question of the nature of alternative explanations if the hypothesis is refuted, which Popper for instance contends is the basis for scientific progress. The basis for competing hypotheses is lacking, and in my view there is little opportunity for the demonstration of any alternative logic. This goes counter to the recent Quinquennial Review recommendation that high priority be given to invention and innovation. Anyway, on the face of it, it is hard to see how methodological innovation and individual

research interests on the one hand and the service function on the other are compatible.

Some of these assumptions were recognized in a later document, (Binswanger et al. 1977): "To solve the technical problems of investment, to improve the natural resource base and to guide agricultural research effectively, requires knowledge about the socio-institutional problems of agricultural resource management and production" (p.2). And Bunting, a member of the CGIAR, has written of the international centers that : "... economists and other human scientists ... have been harnessed to unravel the difficulties with which natural scientists are confronted, and to suggest the most urgent and relevant topics for natural science based research" (1978a, p.21).

Implicitly in the later ICRISAT document and in the statements quoted here the service function of social science is transformed into a directing function which would give the social scientist a much more important and more progressive role inside the research center. Ryan's work on nutrition is a notable example of this, but not derived from VLS (1977). However, this directing role may in practice be undermined in the sphere of Village Level Studies. Firstly, it will be undermined by the chronology of the research programs inside ICRISAT. By virtue of necessity and the long time lag between hypothesis formulation and the dissemination of results (which makes research in economics more like a tree crop than an arable one), economists cannot specify research directives to biological sciences until long after biological science has begun research, whereas logically social science research should precede that of biological science if both are regarded as of equal status. The directing function being historically impossible, the nearest approximation is a modifying or critical function within biological science. More importantly, the directing function is also undermined by the nature and scope

of plant breeding, despite the many achievements of this science, often unappreciated by social scientists. In practice, breeders can select for a few variables: plant head height, panicle size and yield, resistance to a few diseases, uniform maturity, maximum tillering, drought resistance (D.B. Singh, 1978, personal communication). Thus the modifying or critical function of social science not its directing one has to be of greatest practical utility with the adaptive aspect of biological science, such as the farming systems research, but not with breeding itself.

In the field of agricultural marketing (see von Oppen 1975), research was justified on the basis of providing empirical measured and quantified evidence of the magnitude of the regional production response to efficient marketing systems based on specialization according to the law of comparative advantage. An ingenious didactic model was developed. Work on price elasticities of supply and demand was initially justified as "necessary" by implication to this model, "and because the relatively inelastic demands for ICRISAT crops led scientists to expect substantial market price and adjustment effects from any major technological advances" (see Bapna 1976; Kanwar and Ryan 1976). Such work has also been shown necessary for the analysis of income distribution. The perfect operation of the law of comparative advantage requires perfectly efficient marketing channels. It follows, ceteris paribus, that deviations from the norm reduce the efficiency of operation of the law. This justifies including the examination of criteria which determine efficiency in agricultural marketing in the program of research. (Again efficiency can only be examined insofar as the variables employed can be measured; and the variables not measured and not included can be presumed to operate in certain restricted ways on those measured). The law of comparative advantage is thus theoretically and methodologically central as an assumption to the program of marketing research.

The fact of the operation of the law, the question whether competitive marketing systems were a necessary but not sufficient condition to lead to regional specialization and an increase in production, and the validity of the assumptions about production on which the response is based have not been questioned. The research plan, however, does recognize "limitation to specialization in individual farms and regional cropping systems ... due to economics of complementarity or environmental restrictions" (p.5). The research is regarded as policy relevant and welfare oriented. It was asserted that "regional specialization would be highly beneficial to the Indian agricultural economy", even if it results in a lowering of production in certain individual States in the "national" interest (as indeed the empirical example shows is one of the logical outcomes of regional specialization according to comparative advantage in an unrestrained and perfectly competitive market).

With reference to policy relevance the same comments made for VLS are relevant here. The research was justified as relevant for policy within ICRISAT by virtue of the fact that "indications would be given for location specific requirements for new varieties and cropping systems through the regional outreach within India". It would be interesting to know whether the research (now completed--see Bapna 1977; von Oppen 1978) has actually been used in this way. In agricultural marketing, policy has been studied in the sense that the effects of market regulation on production, the provision of rural roads on production and the effects of trade restrictions on production have been respectively subjected to regression analysis and simulated, but the process of policy formulation and implementation in agricultural marketing and its costs and benefits to a disaggregated society have not been analyzed.

Finally, somewhat separate though relating theoretically to the sensitivity of a competitive market (and relating practically to the sensitivity of an imper-

fectly competitive market) is the topic of consumer preferences for foodgrains. This elegant study is clearly related to the Economics Program's perceived service function to biological science. The impetus, however, came from the social sciences.

2.2 Present Relevance

In this paper there is no detailed critique of the impressive body of substantive results. We are concentrating on the actual operational rationale of social science research inside ICRISAT to illumine both some of its special opportunities and its constraints before the outreach program in West Africa is finalized. We shall do this by going below the appearances of stated intention and by looking at the reality of the content of the output. A content analysis of 36 reports referenced for a description of the work of the Economics Program for the Quinquennial Review Panel, nearly half (15) consisted of the results of the analysis of secondary data or published data and half of these were or contained literature reviews. It is hard to see the influence of other organizations in this work and the hoped for collaboration appears to have been less than anticipated.

A relatively large number of papers written--10--are dominantly methodological. This is inevitable at the start of a major project. Yet it has been raised by the Quinquennial Review (which used "methodological regour and innovativeness" as a criterion for reviewing present research) into something of a mandate--to be methodologically and theoretically innovative. This is not valuable as an end in itself especially if associated with interstitial research not necessarily in the mainstream. The service function to biological science has had to be greatly ramified. Social science performs a modifying function for the applied programs. Policy relevance relates most clearly to policy within ICRISAT and not to national or to State policy formulation or implementation. In the Sahel involvement in the provision of background material for the "ration-

alization of State policy formulation" will be unavoidable. However, it is doubtful whether the State technocracies in West Africa have the political independence effectively to implement. The modifying function within the applied programs ought to continue in spite of special constraints, most notably a relative lack of technology to apply.

Fourteen of the 36 papers to which reference was made in their report to the Quinquennial Review by the Economics Program have resulted from VLS (ICRISA 1978). In practice, questions of income distribution have moved steadily up the list of priorities. The objective of the identification and quantification of all limiting constraints on production is impossible to achieve. This does not mean that village studies are not essential--they are--but it means that one must not ask them to answer questions where experimental social "controls" are necessary unless all assumptions about the importance and interaction effects of unincluded variables can be complied with and coped with. And using villages as social laboratories demands consideration of competing hypotheses.

In the field of marketing economics the focus on the law of comparative advantage and on the allocative efficiency of marketing systems has theoretical and practical interest within the field of neo-classical economics, and it may be justified in India insofar as India is a comparatively advanced market economy. This a priori is not as justifiable for SAT West Africa. Furthermore the neglect of the extractive role of the marketing system (via relative prices, the terms of trade etc.) because this topic is well studied by others in India deserves remedy in the context of West Africa.

The problem of consumer preference is inherently interdisciplinary and relates relevantly (though subject to caveats discussed earlier) to ICRISAT's biological research via the modifying function.

A main implication of the review of literature (Harriss 1973a) is that in the Sahel, to disregard the formulation and implementation of policy would be irresponsible. The nature of policy-making and implementation does throw up quite intractable problems for the social scientist who proceeds by scientific method alone. To neglect agricultural policy altogether would be to abandon pretensions to realism, let alone to relevance, in social science research. Yet to include it requires very delicate fieldwork certainly of a different nature to that already done in ICRISAT--not necessarily research that is methodologically innovative either because there exist satisfactory frameworks for the analysis of policy, an area in which ICRISAT to date does not necessarily have a comparative advantage of experience.

2.3 The Quinquennial Review (October 1978)

Before we finish this evaluation of the rationale behind the present thrust of social science research in ICRISAT and its relevance for West Africa we have to refer to the recent quinquennial review because strong priorities for a research program were expressed. We shall not consider the QQR's recommendations for India (though they are included in the Table of subjects later on as an indication of the degree of likely and useful parallelism possible in the two programs in the future).

The QQR recommends that priority be given in Africa to topics in the marketing fields:

- i) Marketing Systems
- ii) Price Policy
- iii) Interregional Trade
- iv) Estimation of supply
and demand elasticities
- v) Marketed Surplus (p.90)

Presumably these are not in order of priority for (ii) presupposes knowledge of (iv), and (i) of (v).

These were justified in terms of the greater importance of poor marketing systems to production in West Africa than in India; and in view of the particular policy problems posed by State intervention (p.91), as well as the need to strengthen national programs.

We shall refer back in detail to these recommendations later on. Suffice it to say that all these subjects, with the exception of (ii) Price Policy, have been investigated by the Economics Program in India. It therefore has something of a comparative advantage in expertise (though the policy issue is an important gap). This comparative advantage is useful in view of a further QQR observation: "Before taking up a new economic research project, a serious enquiry is made about ICRISAT's comparative advantage in undertaking it and about the national research record and potential in the field". That there is no doubt about the former should not prevent the E.P. from being alert about the latter especially in view of the extreme importance attached to training in West Africa.

However, the QQR goes on (p.92) to state that ICRISAT should "concentrate on rigorous modelling and estimation work". This is impossible with the present data base. There are no macro level statistics on supply, production, price, income and interregional trade flows worth using if the intention of such use is for some substantive result. In some countries production is calculated as a function of rainfall data and supply on the market is a standard proportion of production. Price data are extremely problematic, (Berg 1977). A rough rule of thumb is that case study data (while limited in spatial and temporal scope) is more to be relied on than are official statistics. Extensive urban and rural monitoring over a considerable length of time would have to precede rigorous modeling in the field of agricultural marketing.

Even if ICRISAT manages according to the QOR to "persuade other agencies to make heavy investments needed to develop the basic statistics", it will be years before these will be in usable form. Furthermore, the QOR exhorts ICRISAT to use programming: "to derive optimal solutions satisfying the additional real constraints relevant to small farmers" (p.76) and yet to follow them up when implemented with research on the employment and equity effects of the solutions. In fact, these would have to be already incorporated into the programming models to prevent solutions from being unimplementable. Finally, the QOR sees merit in involving "African professionals to estimate programming models with new detailed data collected under (ICRISAT's) sponsorship" (p.91). The point has been labored in my two tour reports that the number of professionals with such ability is so extremely small that these individuals already often risk being dysfunctionally overburdened.

3. RESEARCH REQUIRED BY OTHER INTERNATIONAL AGENCIES AND BY THE STATES CONCERNED

3.1 The Interests of Funding Bodies

Whatever the research required by the Sudano-Sahelian States, given the fact that their domestic budgets do not balance, it will almost certainly have to be externally financed, so it is worth looking at the policy recommendations of one such important donor and lender, the World Bank. As van der Laar explains, (1976 pp.5-6), the Bank's rural development strategy assumes the stimulus of technological packages. Owing to particular technological problems with open pollination and disease susceptibility in dryland agriculture, "spectacular results are not likely to be achieved in the short to medium term. The rôle of the Bank ... is largely confined to chairing and sponsoring the Consultative Group on International Agricultural Research to which the international Development Associa-

tion contributed \$4.8 m. in 1975". Historically the Bank has been most reluctant to lend money for pure or applied research in food crops, (p.10). Recently, however, policy may have changed. We shall quote at some length from the World Development Report, 1978, ch.6: Sub-Saharan Africa. In the macro region it is observed:

- i) "Agricultural development is hindered ... by the inadequacy of research and extension services (except those for tree crops) and insufficient incentives for agricultural investment ... The great heterogeneity within sub-Saharan Africa makes it difficult to discuss policy options in general terms ... Policies must be adopted specifically to the needs of countries that are tremendously diverse in environment, resources and economic performance ... The distinctive and varied agro-climatic and socio-economic environments in Africa make it difficult to introduce agricultural technologies from elsewhere ... Hence research to generate and test innovations must often be tailored to specific locations", (p.48).
- ii) "Adaptive research in agriculture has not received the allocation of money and manpower that is commensurate with the dominant position of agriculture in these economies or with the potential that exists for obtaining high investments in research", (p.48)--(exactly how is this latter point known?)
- iii) "Strengthening national and regional research capabilities to evolve an appropriate sequence of feasible and profitable innovations in agriculture is especially crucial to the long term development prospects of the region", (p.48).
- iv) "In most countries colonial policies for agricultural research neglected the development of foodcrops. Official marketing boards ... were gradually transformed into instruments of agricultural taxation ... The inefficiency of parastatals ... has typically been accommodated by widening the transport and marketing margins at the expense of the farmer. (Another) consideration adversely affecting farm price incentives (has) been the perennial pressure for cheap food in urban centers", (p.49).
- v) "Local orientation of research and extension ... will need strong financial and technical (adaptive) support from abroad", (p.52). "The international agricultural research centers such as IITA, ICRISAT and CIMMYT are an important response", (p.54).
- vi) "International action can stimulate the growth of earnings from primary commodities by assisting the expansion of output and market shares ... Assistance can be provided to other major exporters which have alternative investment opportunities for diversification into alternative crops", (p.55).

Thus the Bank rates as meriting high priority (i) externally financed (ii) country specific (iii) adaptive research which (iv) strengthens national research capabilities and institutions for research and extension. (v) Agricultural marketing is singled out as important especially in view of problems of the inefficiency of State intervention and (vi) investments for macro-level artificial protection (against "comparative advantage"), price-incentive and regional marketing infrastructure are recommended for consideration. All but (vi) are consistent with the recommendation of the QQR. IBRD has itself commissioned two national level reviews of the marketing systems from local institutions (SONED 1976, for Senegal; and I.E.R. 1977 for Mali).

The research strategy of one major donor, USAID, is quite consistent with IBRD's recommendations. As mentioned in my Tour Report, (No.1, pp.21-6), an adaptive research project for foodgrains in the Sahel, SAFGRAD, including localized research inputs from a sociologist and crop production economist in Upper Volta, is being financed by AID (via Purdue University), as is an evaluation of the ORD de l'Est through the African Rural Economy Program of Michigan State University, where 450 farmers are being sampled for data on credit, traction, agricultural production and marketing. Furthermore, AID through Purdue is helping to reorganize the statistical service of AAVV, the biggest multi-donor project, and in so doing provide data for linear programming studies on crop production.

In Niger, AID has an evaluation unit with expatriate economists and sociologists for the development "projet de productivité de Niamey" located in its headquarters and carrying out comprehensive economic surveys, though the AID proposals for a rural economy cell in INRAN and for a rural market survey

through the Institute for Development Anthropology Inc. have not yet been approved or implemented.

In Mali, AID finances both ICRISAT and SAFGRAD though as yet no rural economy research within them. In Senegal, AID finances a monitoring and evaluation study of agricultural change and induced technological innovation in four villages in the vicinity of the Agricultural Research Station at Bambey.

AID has already financed a corpus of rural economy appraisal through the consortium for the Study of Nigerian Rural Development, through Kansas State University, the African Rural Economy Program of Michigan State University and the Center for Research in Economic Development at the University of Michigan, (CILSS/Club du Sahel, 1977), (and I think has financed the Niger project of the University of Arizona). Lest it be thought that they have neglected marketing it was AID in major part which financed the Stanford-Cornell School of Agricultural marketing studies in the late sixties and early seventies, subjected to a critique in Annexe 3 of Harriss 1978a. AID also financed the CILSS report on "Marketing Price and Storage Policy in the Sahel", reviewed in Annexe 2 of Harriss 1978a. However, in the face of this formidable research thrust there is still scope for local level research in the economics of agricultural marketing for this is currently restricted to under three individuals per country undertaking research for higher degrees (in the West). It is perhaps significant that very few local professionals are engaged in this research effort.

3.2 The Priorities of State Technocrats

The demands of the States in the field of agricultural marketing were articulated very clearly in late 1977 at a meeting of local national economic technocrats (CEAO, 1977, vol.2, pp.9-11). Recommendations were for research:

- i) to strengthen the official marketing organizations

- ii) to rationalize and legalize private trade
- iii) to strengthen the parastatal ownership and operation of transport
- iv) to improve storage infrastructure
- v) to increase storage capacity
- vi) to implement macro-regional buffers
- vii) to involve producers in the process of price fixing
- viii) to harmonize marketing margins internationally
- ix) to rationalize price policy (in relation to inputs, timing of price announcements, world market prices, and involving consideration of national subsidies)

All these subjects (perhaps barring (iv) to (vi) at the "State" level) require research. (i), (iii) and (vi), in contradistinction to Bank Policy, involve a strengthening of the State intervention, identified already as a major problem by IBRD, (vii) to (ix) are problems of price policy identified as requiring research by the Bank. (ii) is also consistent with Bank Policy. ICRISAT has no obvious comparative advantage of experience in these research areas.

However, the review of literature makes very clear, (i) the limitation of the State to implement policy, plus (ii) its refusal to implement policies against the upper levels of the bureaucracy, the bourgeoisie and the army-- (which is the political decision taker and the real authority ruling parastatals in most of these countries). So this sets very severe constraints on the practical utility of what is stated by the technocracy, by the International agencies and by the QOR to be policy relevant research.

A further problem characteristic of excess aid in peripheral countries may emerge: the diseconomies deriving from multiple overlapping projects. In research this may be manifested in rivalry and discoordination and conflicting

policy recommendations which lead to technocratic confusion. Given the array of funding agencies already marshalled for research in rural economy, it is an arena for the exercise of diplomacy.

4. INTERSTITIAL RESEARCH--GAPS FROM THE BIBLIOGRAPHY

The QQR in advising that ICRISAT Economics Program should take care in not duplicating national research efforts has, in fact, given support to interstitial research. At the outset one should caution against this as a dominant criterion since it would be reasonable to assume that existing research reflects a combination of current academic trends, individual interests, feasibility of research, topics deemed of policy relevance and the interests of bodies financing the research. On the face of it, the probability of interstitial research's facing one or a combination of constraints such as unpopularity (collective and individual), infeasibility, lack of "policy relevance", lack of patronage and therefore interest from international funding agencies (even if ICRISAT's funding is committed ex ante) must be high.

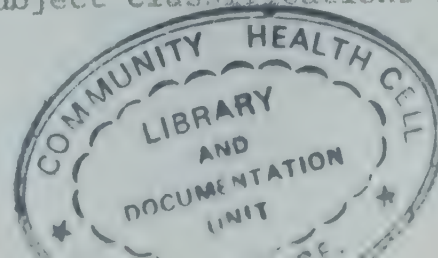
Bearing this in mind, the detailed cross-classifications of the index section of the bibliography can be used to indicate subjects and regions which have been relatively under searched (see Harriss, 1978b). The classification and index was, of course, subjectively compiled (as explained in the introduction to the bibliography, it is an elaboration of the basic classification done earlier for India by von Oppen (1975b)), so that quantification does not mean objective representativity. Seeing that only Senegal, Mali, Upper Volta, Niger and Nigeria were subjected to an intensive literature search, the figures of Table 1 clarify rather simplistically and subjectively the gaps in research already undertaken, with reference to the area covered by these countries.

One interesting fact to emerge from the Table is the relative abundance of existing research in precisely those "policy" areas where the State technocracy has demanded more research; namely price policy (14.1), storage (18), and intervention (16.1; 16.2; 16.3; 16.5).^{*} It is more than likely that much research is neither read nor synthesized by professional implementers and adds further caution to that qualifying the practical utility of much supposedly "policy-oriented" research. It is, of course, also likely that good syntheses are missing, or that high quality research is still required, the literature evincing low quality field work and academic incest.

Another related point is that quantitative indices do not betray anything about quality or rigor. It is quite well known that the literature for ex-French West Africa reflects French academic tradition in the same way as that for the ex-British colonies does British academic tradition. Thus, the French literature shows a sharp division between the micro-level descriptive work of anthropologists and geographers on the one hand and highly technocratic macro-level work of economists trained initially in agronomy, on the other. (In this class has to be added the work, sometimes of low quality, of international consultancies). There is also a recent overlay of economics research in the American tradition. It is all strongly expatriate-dominated. Village level research, (apart from the anthropogeographical), is confined to evaluations and small surveys usually financed by and directed towards the interests of (partially) internationally financed agricultural development parastatals. The Nigerian literature is much richer and has various qualities of research in the Anglo-Saxon tradition of agricultural economics as well as anthropology and geography. There is generally greater emphasis in economics research on field work.

^{*}Bracketed numbers refer to the bibliographic subject classifications in Harriss 1978b.

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Thirdly, though we should recognize that topics where zero has been entered in relation to a country may well have some contribution either in the pipeline or not internationally available, low percentages may indeed be taken as indicative of requirements for interstitial research. Thus:

- i) The determinants of demand (12.1; 12.2; 12.3) including income elasticities, geographical, social and seasonal patterns of consumption and nutrition; and consumer preferences, are underresearched,
- ii) Similarly the determinants of supply, including price and non-price factors, and the role of relative prices in all their complexity require research (13.3; 13.6; 14.2; 20.5; 20.6),
- iii) Then the effects on marketing systems and on agricultural production of market regulation and interregional trade restrictions, and the control and economics of transport is underresearched (16.3; 16.4; 19.2),
- iv) The importance of agricultural credit in relation to private and State marketing, (and agricultural production) needs more research (16.5; 20.1; 20.2).

Apart from (ii), these are somewhat different from the concerns of international agencies and, apart from (iii), from those of the State technocracy. ICRISAT has done some research in all fields except (iv) and thus has some advantages. Though "interstitial", the four major areas of neglect generated by an analysis of the bibliography are not actually of marginal interest either academically or practically. They may well have been underresearched because of their practical difficulty (see last section).

Fourthly, the Table reveals regional differences in research. The dominance of Nigeria is clear. In order of neglect, Upper Volta most deserves research, followed by Mali, then Niger and Senegal.

5. RESEARCH IN THE INTERESTS OF ICRISAT'S TARGET GROUP

ICRISAT was the first of the international centers to be founded at the instigation of the Consultative Group for International Agricultural Research, the international steering body evolving out of the international agricultural

strategy of the Ford and Rockefeller foundations, (Spitz, 1975; Vaillanatos, 1976; Anderson, 1978). This group have defined ICRISAT's mandate as to study inter alia "farming systems and water management techniques to benefit farmers in the semi-arid tropics" (CGIAR, 1976, p.5). The third of ICRISAT's own four objectives is: "to identify socioeconomic and other constraints to agricultural development in the semi-arid tropics and to evaluate alternative means of alleviating them through technological and institutional changes", (ICRISAT, 1977 p.1). ICRISAT's Director states: "An understanding of farmer motivation and behavior is essential if ICRISAT is to succeed in its mission of providing an agricultural technology that is pragmatically oriented to the village and the real life conditions of the farmer" (ICRISAT 1976). "Our job", says the Director, "is to help the poorest segment of humanity", ... "We are dealing with the farmer whose crop is his life", (Rosenthal, 1978). Bunting of the CGIAR writes: "It is local people, and not the preconceptions of foreign observers, who must decide what is, and what is not, appropriate to their circumstances", (1978b, p.30). This mandate has very great significance.

From these statements the primary beneficiary of ICRISAT's research should be the peasant¹, not the state technocracy or the academic community, or the interests of international "aid" agencies. The "direct beneficiary" could equally well be used as a justification for research in social science as it is in biological science and farming systems research.

¹In West Africa where there are very few landless and where most consumers are producers the target group can be identified by this one word. A peasant is a small-scale direct producer using family labor. Elsewhere in the SAT the target groups may be identified as peasants, landless and consumers and it has to be faced that these are all different interest groups.

Table 1. Distribution of research as evinced in published literature (Harriss 1978)

Subject	Total Refs. Gen. and 5 Countries	% of References				
		Nigeria	Niger	Upper Volta	Mali	Senegal
11. <u>Agricultural Marketing Economies</u>						
11.1 General grain	69	26	21	7	7	9
11.2 Millet	31	19	25	13	6	23
11.3 Sorghum	31	38	19	10	6	19
11.4 Cowpea	18	66	28	6	-	-
11.5 Groundnut	32	50	13	-	6	19
11.6 Cotton	8	50	-	13	37	-
11.7 Rice	21	62	5	-	14	10
11.8 Maize	8	50	-	-	-	13
11.9 and 11.10 not relevant						
11.11 Economic Development with reference to Marketing	29	24	14	3	17	7
11.12 Economic History of Agricultural Marketing	40	28	15	3	8	13
11.13 Political Economy	54	24	11	13	5	11
12. <u>Demand</u>						
12.1 Consumption	27	55	4	4	-	3
12.2 Nutrition	27	18	7	-	4	11
12.3 Consumer Preference	7	57	28	-	-	14
13. <u>Supply</u>						
13.1 Ag. production	98	38	22	9	6	17
13.2 Marketing of Produc- tion Factors	8	62	-	-	25	-
13.3 (Non Price) Determinants of Marketed Surpluses	3	43	20	-	3	23
13.4 Barter Relations	17	23	23	4	4	18
13.5 Cattle-grain inter- actions	14	-	50	21	7	-
13.6 Supply (price elasti- cities)	25	44	8	-	4	8
14. <u>Prices</u>						
14.1 Price Policy and Rela- tions to Production	33	54	15	15	18	9
14.2 Internal Terms of Trade	7	14	14	-	14	4

(Table 1 contd.)

Subject	Total Refs. Gen. and 5 Countries	% of References				
		Nigeria	Niger	Upper Volta	Mali	Senegal
15. <u>Efficiency (Price Formation, Margins)</u>	14	71	5	5	5	3
16. <u>Policies</u>						
16.1 General Agricultural Marketing Policy	36	30	8	19	19	8
16.2 Parastatal Intervention	91	30	22	8	8	11
16.3 Market Regulation	5	60	20	-	20	-
16.4 Interregional Trade Restrictions	14	14	21	-	14	14
16.5 State Financing of Marketing	51	75	11	2	6	4
16.6 Food Aid	12	(Not searched)	16	16	8	8
17. <u>Processing</u>	17	35	29	11	-	6
18. <u>Storage</u>						
18.1 Peasant Storage and Storage by Traders	36	61	25	3	14	14
18.2 Storage by the State	29	3	10	10	14	18
19. <u>Transport</u>						
19.1 Peasant Transport and Transport by Traders	22	63	9	4	14	4
19.2 Transport by the State	17	76	6	-	6	-
20. <u>Systems + Structure</u>						
20.1 Credit in Agricultural Marketing (i)Farmer/ Trader	37	35	29	-	5	14
20.2 Credit in Agri. Mktg.	35	28	26	9	6	9
20.3 Trading intermediaries	52	38	13	6	11	14
20.4 Women in Trade	21	38	9	19	9	9
20.5 Household or Honeycomb Marketing	13	46	38	-	-	7
20.6 Periodic Market Place Exchange	34	41	12	17	-	8
20.7 Long Distance Trade	56	30	19	7	11	7
20.8 Urban Food Supply	31	52	6	3	6	13
20.9 Economic Geography of Agri. Marketing	22	36	-	27	9	9
20.10 Effects of Seasonality	18	39	22	-	5	11
20.11 Effects of Drought and Famine	35	11	20	17	3	3
21. <u>Regional Development</u>						
21.1 Effects of Marketing on Production	53	45	13	11	7	6
21.2 Rural Development	78	38	16	21	12	6

(Table 1 contd.)

Subject	Total Refs. Gen. and 5 Countries	% of References				
		Nigeria	Niger	Upper Volta	Mali	Senegal
22. <u>Research</u>						
22.1 Rural Economy Research Projects	18	11	44	5	5	16
22.2 International Agri. Econ. Research	11	27	45	-	10	-
22.3 Research Methodologies	16	31	-	-	-	-
23. <u>Bibliographies</u>	40	20	5	3	-	3

There is very considerable evidence that the peasantry, ICRISAT's target group, in West Africa has been used to generate such resources for non-agricultural development, that its own resource base is severely depleted. Nevertheless, the peasantry has shown quite remarkable resilience in the face of plans formulated and implemented by politicians and expatriate and national bureaucrats to eliminate the peasantry in a transformation into capitalist (plantation or project) agriculture or State-run "socialist" forms of agricultural production. These plans have rarely succeeded, and the peasantry endures. It is well-known (and demonstrated in historical annex 1 of the literature review, Harriss, 1978a) that the peasantry is adaptive and responsive, given the constraints of the physical and economic environment, that the peasantry can expand production, and that they cooperate when it is in their interests so to do, and that because the peasantry does not have to pay land rent and wages they may have high marginal and average rates of saving and are more cost effective producers in West Africa than is capitalist (national or international) or State capitalist agriculture. Some of the literature relating to Nigeria and Tanzania is reviewed in two important papers by Williams, (1975 and forthcoming), as is the situation's implications for research. Given ICRISAT's official dedication to "small" and

"poor" (Binswanger et al. 1977, p.22) farmers, ICRISAT's technologies should not assume the elimination of the peasantry or its transformation into an agricultural wage labor force but should be compatible with its preservation. It has to be faced that this is by no means congruent with development by development projects.

It follows that it is important to understand what ICRISAT need to know in order for its biological scientists to work directly in the interests of the peasantry:

- i) The requirements of peasants given the operation of influences which may be externally controlled and not reformable, (including, as we have seen in the literature review, the marketing system) and given the internal dynamics of the process of peasant production. It also follows that social science research should find out what peasants need to know to improve their own socioeconomic status. This is not simply a matter of information on production technologies as the conventional conception of agricultural extension requires; it also might include:
- ii) the identification of social groups benefitted by the operation of policies and institutions which do not benefit the mass of the peasantry. Here the marketing system appears an important candidate, in particular aspects of it such as:
- iii) the use of resources extracted by private trade and the state from the agricultural sector by price policies and by parastatal intervention;
- iv) the relation between fiscal, credit and price policies;
- v) the costs and returns of State-owned storage technology as opposed to peasant-owned technology, and the marketing policies which accompany State ownership of food stocks.

It is highly unlikely that research which is in the interests of the target group will be useless to other social groups. However, to argue that research differs from policy because policy may be and frequently is "misimplemented" in terms of its stated objectives whereas research remains intact, is incorrect and would ignore naively the ideological nature of all research. Schumpeter says "The way in which we see things can hardly be distinguished from the way in which

we wish to see them". In the same way the way in which researchers carry out their research can hardly be distinguished from the way in which they wish to carry it out. This, as we have seen with ICRISAT, is directly related to the needs of the research community, academic peers, international funders and national bureaucrats and is not directly related to the target groups. What Williams has written so emphatically we take as a point of departure:

"Facts can only be made to speak within an explanation which itself is dependent on the standpoint from which the problem is defined. The assumptions on which research is based generate their own conclusions ... Value neutral research aims to offend nobody in power. Policy oriented research usually takes the objectives of the powerful for granted and seeks to ask how they can refine and realise their aims. State actions are not determined by the disinterested advice of academics, but by the requirements of the dominant classes", (forthcoming, pp.319-24).

We might debate Williams' distinction between academics and the dominant class, but the point is what to do about it?

ICRISAT has been founded with the resources and the financial and academic independence to pioneer research in the interests of its target group and social science research can be easily and well justified in such direct terms.

i) Such research has to be defined in terms of the problems some of which have been specified above. But it is quite unlikely that an English academic can identify all the research that is in the interests of the West African peasant producer, contact with whom during the course of the consultancy has inevitably and conventionally been minimal. It is important to consult the peasants themselves in the process of problem formulation. Very few of us normally do this, some objecting that the very strangeness of the researcher in the eyes of the target group will warp or redefine their "problems". Yet there is no harm in a move towards consultation and dialogue. And, as Chambers says, "to neglect the stock of indigenous technical knowledge and the processes whereby rural peo-

ple adapt and communicate and create knowledge is both inefficient and wrong". (1978, p.3).

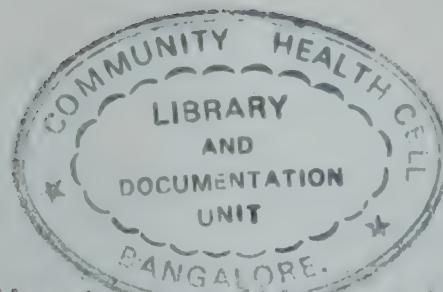
ii) Such research must also be defined in terms of the style of fieldwork. Style is also relevant to ICRISAT's objective No.4: "to assist national and regional research programmes through cooperation and support ... and training". (ICRISAT, 1976, p.1; and see Bunting, 1978b, p.19). One point apparent to both David Norman and myself in our travels in West Africa has been the lack of trained investigators and "counterparts" at any level. ICRISAT will be working in the interests of its target group if it trains a few people well with a long term commitment; rather than many who will be sucked into the mainstream of international agencies, (see Bunting 1978b, p.15). This might be achieved if the ICRISAT social scientist also has that commitment and does fieldwork alongside the investigators ... or working as a two unit team in the usual manner of a social anthropologist. The disadvantages of this style in terms of conventional fieldwork are its slowness and its small scale. But given the social environment of the Sahel this means of data gathering is almost enforced, should data quality be of slightest concern. Other ways of getting social data will be subject to strongly diminishing marginal returns and with increasing scale of project the marginal returns may well be negative.

A second point concerns the object of research: the peasant, and also sets conditions on the style of field research as well as on the content. Hill has written: "We must study the farmer, not patronise him; we must assume that he knows his business better than we do, unless there is evidence to the contrary", (1970, p.28). Again, Williams has put the implications succinctly: "Peasants are not data". (In contradistinction to the "social laboratory" ideology set out by Binswanger et al. 1974, 1977). "They are a source of knowledge and wisdom to be learned from, argued with and respected", (1975). Granted the

validity of this line of thinking it follows that social science research requires research workers, (not just "investigators") capable of taking on the peasant in dialogue. Again, this points towards the "researchers" themselves as part of a two/three person unit engaged in dialogue in order to maximize the true social benefit of field research. Returning to Williams once more: "A dialogue with farmers requires deep knowledge of the history and social relations of specific communities and their relation to the wider society. The aim should be to protect them from the errors of ambitious men", (forthcoming, p.325); or, more modestly "to transfer the power of action back to rural people", (Swift, quoted in Chambers, 1978, p.6). The social science research worker is therefore at best a crucial interpreter of the actions of the State to itself, and an intermediary between the peasantry and the biological scientist.

iii) The third aspect of the definition of relevant social science research is its presentation (not necessarily its analysis). This is a very difficult issue. The international centers aim to concentrate information in each crop on a scale unparalleled before (Vallianatos, 1976, p.60). Spitz has shown how one result of the expansion of the international centers' research in crop breeding is that it has physically multiplied knowledge above the capacities of the intellectual and scientific elites in underdeveloped countries to assimilate it, (1975, p.10); national agricultural research centers cannot adapt technologies at the rate of which they are created--a paradox, since the international centers were conceived to strengthen weak national "knowledge systems", (Bunting, 1978a, p.14). "The institutes are there to be used", (p.30). Furthermore, "international systems of professionalism dominated by the universities, professional associations and journals of the richer countries reinforce values hostile to indigenous knowledge and penalize values which are open to it", (Chambers, 1978 p.11--citing several examples). Then the dissemination of this knowledge is

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certainly not socially neutral. We all direct our writing, as here, to each other, to academic peers, perhaps to our funders and sometimes to students in our disciplines. We rarely rigorously and deliberately popularize. Yet "peasants lack access to the literate culture through which the contemporary State is administered", (Williams, 1975, p.151). Our writings are in technical jargon, in foreign languages, in inaccessible journals and books in inaccessible libraries. If this is granted, then a legitimate aspect of research should be communication with the beneficiaries. Small scale is inevitable. Means such as local language, verbal dialogue, clear and intelligible bulletins in local languages (not just in French, though that is essential), film, and visual aids would have to be experimented with. These means of communication are time consuming; they may be transitory. They will not bring praise from and status among most academic peers, though the use of such means of communicating research to its beneficiaries need not preclude (time permitting) presentation of initial results in the conventional form of academic publications.

We are mindful of several general paradoxes and dangers: that what is "appropriate", "relevant", "optimal", is usually defined by people external to the peasants' production and exchange system, that it may be very difficult indeed for representatives of the international academic bourgeoisie to "take the part of peasants"; also, "the contradiction and the consequent parasitic symbiosis, indeed dependency of radical development studies upon the very thing they criticize, the development activities mediated by experts", (Adams, 1978, p.22). We must stress that we are not asking for experimental "action research", (Belshaw, 1976, p.15), to be fed back into the planning process. We are asking on the one hand for "clarity and logic", (Adams, op. cit, p.24) in the interpretation of the results of the planning process to planners, and on the other

hand for research which consults and represents the interests of the target group. Furthermore, we must stress ICRISAT's structural similarity to IRRI in their self-assessment : "They are high quality research institutions in developing tropical countries, but they are independent from the financial limitations, political considerations and staff shortcomings which plague most developing country institutions ... That is they are in, but not of, the Third World. They are also not members of a world or regional political body subject to the pressures that pervade such organizations". (IRRI document, 1978).

We must stress that ICRISAT has the resources, the supposed independence and the definite mandate to undertake such work.

6. A COMPARISON OF THE TOPICS JUSTIFIED IN TERMS OF THE CRITERIA DESCRIBED

We have discussed in varying detail the topics justified in terms of seven criteria: ICRISAT's original justifications for relevant research; what the E.P. has actually contributed and therefore has a comparative advantage in; the QQR's priorities for West Africa; priority according to the interests of external funders; priority according to the State technocracies; priority according to gaps in research manifested in published work; and finally, priority according to the presumed interests of the target group. (See Table 2). All except the last are defined according to existing distributions of power in policy and research.

In so doing we have discussed some of the implications (for the content, feasibility, form and presentation of such research), of using each criteria, especially the implications of using the last. So Table 2 summarizes the research topics generated with reference to these seven criteria. Three points deserve mention at the outset:

Table 2. Research topics in relation to seven justificatory criteria.

Research in Economics of Agricultural Marketing	ICRISAT Quinquen- nial Review recd. for India re. relevant for para- llel res- earch in West Africa	ICRISAT Quinquen- nial Review recd. research for West Africa	ICRISAT past work in India re. comp- arative advantage in research	Caps from Biblio- graphy	Priority according to World Bank	Priority according to State techno- cracy	Priority according to direct interests of ICRISAT's target group
1. Storage: (costs, losses, time, distribution, com- parison between village and parastatal institu- tion)	-	-	Accepted for fu- ture	X	-	X	X
2. Price and non-price factors conditioning marketed surplus. The definitions of 'sur- plus' and 'supply'	-	X		X	-	-	X
3. Price formation: Price elasticities of supply and demand. Cross ela- sticities of supply between 'food' and 'cash crops'.	-	X	X	X	-	X	-
4. Access to market of dif- ferent types of farmer	X	X	-	X	-	-	X
5. Price policy: social impli- cations of changes in relative parallel and offi- cial market prices for dif- ferent commodities. Rela- tion between fiscal, credit, and price policies	-	X	-	Much lit. but poor quality X	X	X	X

(Table 2 contd.)

Research in Economics of Agricultural Marketing	ICRISAT Quinquen- nial Review recd. for India re. relevant for para- llel res- earch in West Africa	ICRISAT Quinquen- nial Review recd. research for West Africa	ICRISAT past work in India re. comp- arative advantage in research	Gaps from Biblio- graphy	Priority according to World Bank	Priority according to State techno- cracy	Priority according to direct interests of ICRISAT's target group
6. Demand determinants, consumption and nutrition, income elasticities	X	-	X	-	-	-	
7. Consumer Preference	X	X	X	X	-	-	X
8. Market structure conduct and performance, including costs. Physical infrastructure	-	X	Accepted for future	-	-	X	
9. Size form, pace and direction of transfer of physical and financial resources	-	X	-	X	-	-	X
10. Inter-regional flows, trade transport and regional specialization	-	X	X	X	-	X	X
11. Costs and benefits from external intervention, reasons for replication of failed projects	-	-	-	X	-	-	X

- i) A large number of topics--11--are identified as requiring more research;
- ii) Many are justified by most criteria;
- iii) Most research could be in the interest of the target group. The whole point is that whether or not it is depends crucially not on topic but on how the research is conducted, disseminated and used. ICRISAT has control over the first two, and partially over the third.

In order of importance according to the number of interests satisfied, consumer preference studies rank first followed by price policy and inter-regional flows, price formation and elasticities, access to market, storage, price and non-price conditioners of marketed surplus, market structure conduct and performance, resource transfers, consumption and nutrition, and the effects of external intervention.

This is a rough guide to "relative importance", but it could be modified by considerations of coherence as a series of subjects forming the building blocks of a research edifice, and by considerations of feasibility. As we explained earlier, ICRISAT's Economics Program faces the contradictions that it has to operate in collaboration with the States concerned, though they may operate in the interests of ICRISAT's target group only in order to achieve political stability; that research into policy formulation and implementation is very important but very delicate; and that research to modify the biological program faces the problem of the latter's incipient nature. We shall finally examine the topics generated by the compromising methodology in order to assess their practical feasibility.

7. FEASIBILITY

7.1 Consumer Preference Studies

Of relevance to price policy would be an analysis of the sensitivity of parallel market prices to variety and quality in millet and sorghum at various times of year. At present none of the parastatals distinguishes in price between the crops, let alone between varieties or qualities (whereas rice may have up to six prices). It would be useful to see whether assumptions made about production costs for millet and sorghum by the administrators of parastatals are justified and if not whether the present crude policy gives rise to any distortions in production. Such research might also feed into interdisciplinary consumer preference studies of the sort already carried out by the Economics Program in Hyderabad. However, whereas these studies have demonstrated the sensitivity of the price system both to latent and to cryptic quality and nutritional characters, problems in West Africa are going to be:

- i) establishing prices given the widely attested, highly individualized nature of price formation through haggling;
- ii) establishing the representativity of that price.

Distinct advantages of such work are its interdisciplinary nature, the modest scale of operation, the fact that it should, in theory, feed back into the biological research program, its political unexceptionability. The insights from field research for such a project will be very valuable for other more sensitive issues and this research would allow the possibility of familiarization with the local economy and with the local research community. ICRISAT has a comparative advantage. It is a good candidate for a start.

7.2 Price Policy

There is a growing conviction among administrators that the poor production record of millet and sorghum is overwhelmingly due to artificially low prices

and this concern has spurred a number of isolated research efforts into the determination of the costs of production prior to "rationalizing" the official absolute or relative prices, which are relevant at best to about 5% of grain produced.

In these studies daily labor is normally costed at the "guaranteed state interprofessional minimum wages" likely to be a considerable overestimate of the opportunity costs of agricultural labor. While village level research would illuminate the degree of overestimation; the establishment of the SMIG/SMAG² is the result of political bargaining. The social value of such research lies much more in the demonstration of the costs, (plus therefore the power) of the present socio-political structure than in its direct implementability.

Basic systematic research on regional, social and international variations in the costs of production of staple foodcrops is still lacking, as is an examination of spatial and social variations in profitability, using the prices of the parallel market. Village level studies could provide this data.

Assuming the present rigid policy of (fictive) monopoly and of purchases at fixed prices by the State institutions, the parastatals in each country need to know and define the annual surplus (and the stocks, and combinations of stocks and supplies) required by them to maintain supplies to towns and deficit rural areas and to maintain predetermined intra, inter seasonal and security stocks. They need to determine the producer price (absolute or relative) that will guarantee the minimum level of supply and that will optimize combinations of cash and subsistence crops. There is some scope (especially in relation

²SMIG = Salaire Minimum Interprofessionnelle Garantie

SMAG = Salaire Minimum Agricole Garantie

= Guaranteed Minimum (Agricultural) Wage.

to the priorities of a "rational price policy") for research designed to assess whether the distributive margin itself can be reduced (so that producer prices can be raised and consumer prices kept constant) by improvements in logistical planning under various assumptions of supply and demand, and stocks.

Methodologically, in terms of the linear programming algorithm, these sorts of problems are complex but not insuperably difficult. However, it would require a major research project in each country to generate the data; and to do this for a form of intervention which is of questionable appropriateness in view of its rigidity could be concentrating resources suboptimally.

Related to the last research problem is that of the economic repercussions of a rise in the producer and consumer prices of millet and sorghum in the face of constraints such as the inability of existing domestic budgets to be domestically financed, the external finance of all capital investment, the consequent lack of investment surplus mobilizable for, say, subsidies to marketing institutions and finally, the major constraint, that the real incomes of the urban salariat must remain constant.

An important paradox is that all of the work identified broadly under this discussion of "price policy" has to be in depth and country specific; and yet if official price policy is not coordinated throughout the Sahel then continual and not-trivial distortions of supply and demand in regions adjacent to the long international frontiers will be maintained. Again, an understanding of the interests served by such long distance trade may give us powerful indications of political reasons why, despite repeated declarations of technocrats, no coordination is in sight.

7.3 Research on Interregional Trade Flows

Millet and sorghum have never been as important as cattle as traditional inter-regional trade goods in the Sahel. However, they lead the subsidiary goods and were undoubtedly crucial in the trans-Saharan exchange of salt and potash against gold and forest products. Even with the reorientation of trade away from the desert and south towards the coast, millet and sorghum, groundnut and cowpea remain important contributors to the real balance of payments of Sahelian countries, and particularly Niger. This is a trade often still carried out by barter, therefore, avoiding the restrictions of unconvertible currencies though at the same time limited by the nature of the barter process to certain goods, certain routes and certain trading communities.

The role of the marketing system on aggregate agricultural production could usefully be followed up at the macro-level of the West African region. It is likely that, for reasons to be researched, the modern states, deliberately, or by default, place greater restrictions on their traditional "international" trade goods (in which "subsistence" crops are important), than they do on coastal export trade goods (in which "cash crops" are important). Thus traditional interregional trade has almost certainly declined through time, and present internal interventions may be tending to isolate regions previously integrated, with deleterious effects on production. The pattern of ownership of trucking facilities and the marketing of diesel fuel is another subject requiring research, because of its implications for marketing efficiency and for agricultural production. Unorthodox research methods such as oral history might have to be used to research these topics.

7.4 Research on Storage

There are special problems connected with the integration through time of the supplies of food. This involves peasant and state storage strategies from

times of plenty to those of scarcity. There is much historical evidence to show that peasant storage practices (whatever they had been before the French) were characterized by destocking to meet the cash requirement of taxation under the French who then coerced peasants into building up private buffers to cover several years of low production. Since Independence, general reactions against large private buffers have been encouraged by successive national Governments who have promised security in times of penury, as well as by international aid agencies for the different reason that current wisdom suggests that large-scale centralized storage structures, (large-scale and centralized in comparison with the peasant alternative) benefit from economies of scale, efficient management, less physical damage to crops and easier financing of stock. However, the argument that such storage facilities reduce seasonal price fluctuations has not been borne out by any evidence. Given the failure of state and international intervention to provide effectively for the most vulnerable rural areas, an investigation of peasant storage facilities would shed light on possible improvements to rural regional security. Though this seems a priority area for research one must recognize acute difficulties with survey type research since for a wide-spread example, only the family head may inspect the granary, and in Hausa country for instance the granary is kept closed after harvest for four to seven months of the year with severe religious sanctions against disturbing it.

Investigations of storage and disposal practices would also feed into the analysis of the nature the supply response to price which is directly relevant to the rationalization of an, as yet, totally uncoordinated price policy.

7.5 Research on the Price and Non-Price Conditions of Marketed Surplus

The recent report of the "Colloque sur la developpement de la production et de la commercialisation des cereales dans la communaut " for the Economic Committee of West African Countries (held at Bamako, in December, 1977) mentions such research as of high priority (CEAO 1977, vol.11, p.50), for an appreciation of the interaction of prices and incomes policies in the countries of the Sahel and for their subsequent rationalization.

Were this type of survey possible, however, it has been suggested that the equilibrium assumptions behind the elasticities would be invalidated by the changes in planning priority about to be made to the import substitution, production and consumption of subsistence foodgrains in the Sahel; particularly important in the substitution of "pain de mil" for wheat bread.

There is some evidence from Mali of a negative supply elasticities for millet with commercialization, that because of differences in profitability, together with the assurances to farmers on the part of the State of supplies in times of penury, and better marketing infrastructure and organization for cash crops than for foodcrops, the penetration of the market economy results in a reduction of land down to staple foodgrains, with counterproductive long term effects and increased external dependency on substitutes to millet. It is obvious that rigorous, systematic testing of what at this stage is a hypothesis for which sketchy evidence exists is important. Should the elasticities be low, as is likely when the only known case study figure for the price elasticity of supply is 0.1 - 0.3 and should the functional forms prove complex, this simply means that using price policy to "fine tune" the agrarian economy is inappropriate.

But problems in establishing price elasticities are legion. If supply is unresponsive to price at the low levels of the official system which are relevant to a small proportion of the market, then what is the supply relationship to meaningful prices: those of the parallel market? If these prices, which are mostly, but not always, higher than official ones, are actually transmitted to producers through the parallel system then production and supply will be even more unresponsive to real prices than to official ones. If, however, the market distorts prices so that consumer prices are higher than official ones while producer prices are lower, then the agricultural sector may actually be more responsive to price than the official statistics make out. We know very little about these hypothetical relationships.

The concept of surplus has to be defined carefully. Some data sets define this simply as what enters the public distribution system (2 - 5% of production). Others enlarge figures of surplus by a set percentage which incorporates the traditional sector (10 - 15% of production). However, what is not clear is the identity of the traditional sector, which is often confined to rural-urban or interregional trade. Excluded then is the local trade, often carried out by barter by women. Inclusion of this sector may raise the marketed surplus by a further 5 - 10 percent. Finally, it is difficult to know whether to include in the concept of surplus regular gifts which merge with kind repayments for services rendered.

There are formidable problems attached to the measurement of a response to price because of peasant stocking strategies and the nature of the agrarian system. Surplus has two major types of origin: from the communal field where the extended family's labor is organized by the chief who finally takes decisions on storage, allocation and sale of foodgrains, and from the smaller private fields of each family member, both male and female, who, if they grow

grain, grow it as a cash crop for sale. Constraints on the decision-making and resource-allocation of males, females and the communality are different and their response to price, as to technological innovation generally is likely to differ. Furthermore, price response may vary with the relative or absolute size of the change in price, with the agrarian region and the nature of competing crops, with family size and the consequent size of cultivated acreage. How aggregate elasticities cope with possibly conflicting disaggregated trends is problematic.

Furthermore, our concept of price "response" (and of market "integration") may need to be ramified, for in much of SAT West Africa until very recently production units were "self integrated" through time, with a storage capacity for, in many cases, three years; and in some cases, seven years. These are strategies of survival perfectly adapted to a high-risk production environment, but not to the consumption needs of a market economy whose power is concentrated in urban areas. Any farmers' response to any one set of absolute and relative prices will be modified by production conditions in past seasons and by the current state of the stores. Surplus may be sold only after a critical quantity is stored. Thus any response to price be lagged and the length of the lag may vary. No systematic study has ever been made of these interesting but thorny conceptual problems.

Finally, the concept of the distress surplus (obligatory sales to obtain cash for taxes) is also ramified here by the prevalence of cash remittances from migrant relatives.

7.6 Research on Traditional Market Systems

Given the highly problematic nature of present Government intervention, it will be necessary to test the assumptions on which this is based. These assumptions have the ring of familiarity. They are that traditional markets are

inefficient, that traders take monopoly profits and exploit both producer and consumer, that seasonal and interseasonal price fluctuations are exaggerated by speculative hoarding and that capital accumulated through trade is unproductively consumed and leads to disproportionate social power. Parastatals are, of course, also justified by the need to amass public buffer stocks. However, the main beneficiaries of the present type of State intervention appear to be the very traders whose powers the Governments wish officially to curb.

It is often alleged that two reasons for State intervention in agricultural marketing are to curb excessive accumulations of capital by traders and to encourage its productive investment. Given what is known about the accumulation and reinvestment of profits from, for example, groundnut trading by parastatals, the whole area of the nature and speed of resource transfer from agriculture via trade calls for research. Such work would additionally illumine the interaction between the State apparatus at the macrolevel and agricultural production at the microlevel, a relation about which little is generally known. It is important in explaining the capacity of the agricultural sector to modernize.

Another problem concerns the role of taxes, well established in several studies as being a potent mechanism preventing rural savings and provoking rural poverty. The relation between agricultural price policy and levels of direct rural taxation needs research.

Such research would, in any case, be necessary for data for most of the other topics mentioned so far. It would also be fairly easy to extend from a village studies program. Problems include the lack of standardization of weights and measures, the lack of good rapport arising from identification with Government, intense suspicion of note-taking in a verbal society, problems of sampling a mobile and often "absent" population, refusals to answer more than

two or three questions at a time. So for more than the reasons elaborated in section 5 of this paper, Indian experience of field methodology may not be directly transferable to West Africa.

Also, investigation into private trade implies a major program of research into the evolution, structure and functioning of agricultural markets; and since research is non-experimental, it would have to include the relationship between these marketing systems in all their complexity--local periodic markets based on micro specialization, exchange between cultivators and pastoralists, interregional trade, rural urban trade, international trade, and the intervention of the State.

7.7 Final Evaluation

A consideration of potentiality and feasibility does not materially alter the list of research topics presented in section 6. The next task is to decide on more detailed specification of areas of research and on the more considerable problems and potentialities of agreeing on an appropriate style of fieldwork and training and appropriate means of disseminating the results. The lack of data and of cadres in the Sahel will force a serious reappraisal of these issues, and the real social value of ICRISAT's social science research will depend on the outcome.

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